

Abstract Submitted
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A null experiment shows that superluminal group velocity of tunneling photons is not superluminal energy flow because it is not sensitive to Earth's absolute motion GEORGE SOLI, Integrated Detector Systems — A method for showing that superluminal group velocity, associated with tunneling photons, is not superluminal energy flow is to measure possible preferred frame effects. In Lorentz invariant theories, causal superluminal energy propagation in one reference frame is acausal in other frames. But Lorentz-violating theories have a preferred frame in which causal evolution is defined and superluminal propagation becomes causal in all reference frames. Null measurements show that preferred frame effects do not exist down to an absolute Earth velocity of 62 ± 426 km/s relative to a CMB rest frame velocity of 369 km/s. The signal is pulled out of the noise by allowing Earth's daily rotation to align photon tunneling direction with the CMB dipole and comparing to diurnally driven oscillations in Earth's absolute velocity measurement.

George Soli
Integrated Detector Systems

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